

# A Checklist of Intertidal Mollusks for Bahía Willard and the Southwestern Portion of Bahía San Luis Gonzaga State of Baja California, Mexico

BY

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(Plate 35; 1 Map)

## INTRODUCTION

THE BAYS OF WILLARD AND SAN LUIS GONZAGA are located in the State of Baja California, Mexico, on the Gulf of California (Lat. 29° 48' N, Long. 114° 24' W), 200 km south of the International Boundary. In time, with improved road conditions, it is probable that this area will become a favorite locality for collectors. For this reason we consider it desirable to present a checklist of the intertidal mollusks that have been found there.

This list is not intended to be all inclusive, but presents a preliminary survey indicating the species obtained in a partially explored area. It is based on the results of a joint field trip made by the authors from February 1 to 6, 1966 during which 310 species were collected. Mrs. Faye B. Howard collected mollusks at both Willard and Gonzaga Bays during the month of May of 1957, 1958, 1959, and 1960. Her collection was made available to us. Dr. Homer King and the junior author collected specimens in January 1960; a report of the specimens they obtained is included here. Dr. James H. McLean collected on February 2, 1966 at Gonzaga Bay. His list of mollusks collected is included in this paper.

The nudibranch fauna of the entire Panamic province is very poorly known. Accordingly, a determined effort was made to collect these animals and to transport them alive to La Jolla, California, where they were given to James R. Lance for photographing and identifying (LANCE, 1966).

The fauna of the Bays of Gonzaga and Willard has not been as intensively collected as that of some of the other areas in the Gulf of California, such as Punta Peñasco (LOWE, 1935), Guaymas (DUSHANE & POORMAN, 1967), Puertecitos (DUSHANE, 1962), Bahía de los Angeles (MCLEAN, 1961) and Isla Espíritu Santo (KEEN, 1964).

## PREVIOUS COLLECTING IN THE BAYS OF WILLARD AND GONZAGA

Historically, the first collectors in this area were the aborigines who are reported to have worn "pearls, berries, white round shells from small snails, and pieces of shell and mother of pearl" (DUNNE, 1952). The earliest historian, Clavigero, 1788 (1937 transl.), reporting on physical conditions in Baja California prior to the expulsion of the Jesuits in 1768, tells "Of the testaceous there are mussels, murex shellfish, mother-of-pearl, and many other kinds of periwinkles, mollusks and oysters."

COAN (1965) reports on the shells of an Indian kitchen midden with a table of mollusks from the midden. He

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shows a photograph of shell designs superimposed on the sand dunes. However, one should be most careful in reporting shell figures supposedly made by Indians. Usually the aborigines were too busy obtaining their daily food to spend time making figures in the sand. The Jesuit priests who were the first Caucasians to live in these regions made no report of such designs (ENGELHARDT, 1929).

Three records of molluscan collecting in the vicinity of Willard and San Luis Gonzaga Bays appear in the literature: (1) The 1921 expedition of the California Academy of Sciences to the Gulf of California anchored in San Luis Gonzaga Bay, dredged there and at San Luis Island to the west. A general account of this expedition was given by SLEVIN (1923). Mollusks taken during this investigation have been partially recorded by BAKER, HANNA & STRONG (1928): Pyramidellidae; BAKER (1926): Triphoridae; BAKER & HANNA (1927): Opisthobranchiata; BAKER, HANNA & STRONG (1938): Cerithiopsidae, Cerithiidae and Cyclostrematidae. (2) The Allan Hancock Pacific Expeditions of 1937 and 1940 collected off Willard Point, at Willard Island, and in Gonzaga Bay. FRASER (1943) listed 8 dredging stations and one shore station, but the mollusks remain largely unworked. However, 21 specimens of *Dentalium hancocki* EMERSON were reported by EMERSON (1956) from one dredge haul in Gonzaga Bay. (3) The 1957 expedition of the Puritan-American Museum of Natural History reported 2 dredging stations, one diving and one shore station within Gonzaga Bay. A general account of this expedition was given by EMERSON (1958).

Shore collected specimens are the main concern of this report, but several dredging records are worthy of mention. *Cantharus bilirata* (REEVE) (fragments only), *Cancellaria obesa* SOWERBY, *Clavus melea* (DALL), *Daphnella allemani* (BARTSCH), *D. crebriforma* (SHASKY & CAMPBELL) and *Trigonostoma campbelli* SHASKY were dredged in 50 m off Punta Final, January 1, 1961 by Shasky, Campbell and Sphon (SHASKY, 1961). On the south side of Willard Island in Gonzaga Bay, in 50 m, *Anatina cyprinus* (WOOD) was taken by the same trio (CAMPBELL, 1961). CAMPBELL (1964) reports 3 specimens of *Terebra adairensis* CAMPBELL from Gonzaga Bay. DONOHUE (1966) reports 2 specimens of *Trivia myrae* CAMPBELL dredged off Punta Final. The senior author of this paper dredged specimens of *Acmaea semirubida* DALL, *Diodora pusilla* BERRY, *Coralliophila incompta* BERRY, *Pleurolina picta* (REEVE), *Aspella bakeri* HERTLEIN & STRONG, *Clavus aeginus* DALL, *Triphora hannai* BAKER, *T. oweni* BAKER, and *Metaxia convexa* (CARPENTER) off San Luis Island in October 1966 and December 1966 in 11 m.

## OCEANOGRAPHIC CONSIDERATIONS

Very little is known concerning meteorological and oceanographic conditions at Gonzaga and Willard Bays. No year around water temperature data are available (RODEN & GROVES, 1959: p. 11), but local inhabitants claim the air temperature rarely goes above 100° in the hot months of July and August (personal communication Alfonsina Urquidez V.). The lowest temperatures are about 40°F. Temperature ranges were corroborated by José Samano Sanchez, Servicio Federal, Forestal y de la Fauna, who is the conservation inspector for this area. Pacific storms create violent winds at Gonzaga Bay, less so at the adjacent Willard Bay. Gonzaga Bay is separated from Willard Bay to the west by a sand spit extending at low tide to Willard Island. This small island, together with the mountains to the west, serve to protect Willard Bay from the wind. Gonzaga Bay is an open indentation in a low lying valley, exposed to winds. The floor of Gonzaga Bay is sandy with many subtidal sand bars, while that of Willard Bay is silty and muddy, with a vast expanse of mud flat at low tide. At high tide a depth of 14 feet (ca. 4 m) of water joins Willard and Gonzaga Bays. The tidal range is about 4 to 5 m. The sea floor outside the bays slopes gradually to a depth of 400 fathoms (approximately 729 m). A small archipelago of 6 islands stretches westward from Gonzaga Bay, the largest and most southerly of which is Isla San Luis, 5 miles offshore. Around these islands, known as Las Islas Encantadas, there are swift currents. The current on the west side of the chain runs counter to that on the east side. Yet the main current of the Gulf of California on the west shore runs south (BERRY, 1954: p. 24; RODEN, 1958: pp. 24 and 33). These factors create a maelstrom which probably is influential in mixing the waters within Gonzaga and Willard Bays. Since extensive evaporation, which increases salinity, occurs in the shallow protected bays of Bahía Concepcion, Bahía San Felipe, and Bahía Adair (RODEN & GROVES, 1959: p. 16) one would expect the same to be true at Bahías Willard and Gonzaga.

## FAUNAL RELATIONSHIPS

This checklist records 310 species of mollusks, of which 102 are pelceypods, 196 are gastropods, and 12 are chitons. Of this number 7 are doubtfully identified ("cf.") and 6 are identified only to genus. This report extends the known range northward for specimens of 32 species (range data from KEEN, 1958, and McLEAN, 1961). These are *Barbatia lurida*, *B. gradata*, *Anadara cepoides*, *Noctia reversa*, *Glycymeris tessellata*, *Mytella speciosa*, *Lithophaga attenuata*, *Gregariella denticulata*, *Diplodon-*



*ta caelata*, *Lasaea subviridis*, *Chama frondosa mexicana*, *Pseudochama panamensis*, *Pitar consanguineus*, *Apolymetis cognata*, *Cyathodonta lucasana*, *C. undulata*, *Petalochonchus complicatus*, *P. flavescens*, *Sinum noyesii*, *Decipifus gracilis*, *Anachis taeniata*, *Nassarina pammicra*, *Engina reevei*, *Clathrodrillia maura*, *Crassispira aterrima*, *C. monilifera*, *Mangelia finitima*, *M. subdiaphana*, *Tenaturris carissima*, *Terebra albocincta*, *Acteocina carinata*, *Pyramidella panamensis*. The northernmost locality for each of these is mentioned in the checklist. One species, *Lamellaria sharonae* WILLET, 1939 (type locality: Anaheim Bay, Orange County, California) was taken on the south side of Willard Island. Two southward extensions of range in the Gulf of California are specimens of *Terebra berryi*, reported by DUSHANE (1962) from Puertecitos, and *Melampus mouseleyi* (type locality, Bahía de Adair, Sonora, Mexico).

Although the molluscan fauna is predominantly Panamic, some members of the Californian province are represented in the northern Gulf. PARKER (1963: p. 124) presents a hypothesis attempting to explain the presence of California province mollusks in the Gulf of California. He considers it possible that the cold water fauna of California entered the Gulf of California area during the colder parts of the Pleistocene and during a time when the sea level in the Gulf was at least 100m lower than at present. The lowered sea level left a narrow continental shelf along which mollusks might migrate northward into the Gulf. Specimens of the following species occurring in both the Californian and Panamic provinces are also to be found at Gonzaga and Willard Bays: *Chione californiensis*, *Transennella tantilla*, *Sphenia fragilis*, *Polinices reclusianus*, *Lamellaria sharonae*, *Hermisenda crassicornis*, *Spurilla chromosoma*, and *Rostanga pulchra*.

The faunal element restricted to the northern and northwestern shores of the Gulf is less well known but includes: *Acmaea strongiana*, *Nomaeopelta dalliana*, *Cantharus macrospira*, *Turritella anactor*, *Terebra berryi*, *T. dushanae*, *Recluzia palmeri*, and *Acanthochitona exquisita*. There are also some peculiarities in faunal distribution on the western side of the Gulf of California. *Anachis varia* and *Parametaria dupontii* are to be found from San Felipe south to Gonzaga Bay, but are not reported by McLEAN (1961) from Los Angeles Bay. Specimens of *Nassarina pammicra* reported by McLEAN (op. cit.) from Los Angeles Bay as a range extension northward from Nicaragua have also been collected by DUSHANE (1964) at Puertecitos as well as at Gonzaga Bay. There are a few species which occur in a very limited area such as *Terebra berryi* and *T. dushanae* (type locality for both: Puertecitos). The former occurs living at Gonzaga Bay but has not been found at San Felipe to the north or at Los Angeles Bay to the south. The latter species occurs uncommonly at Agua de Chale, 24

miles north of Puertecitos; one beach specimen has been taken at Gonzaga Bay; it is unrecorded at Los Angeles Bay. *Strombina dorsata* occurs at both Gonzaga Bay and at Puertecitos but is unrecorded from Los Angeles Bay. *Mitra erythrogramma*, usually taken by dredging, is fairly common intertidally at Willard Bay.

A considerable number of species common to the eastern shore of the Gulf of California is apparently absent from Gonzaga and Willard Bays. These include the following species, which we have collected at either Guaymas or Punta Peñasco, or both: *Astraea unguis*, *Turritella gonostoma*, *Mitra lens*, *Agaronia testacea*, *Cypraea arabicula*, *Thais kiosquiformis*, *Thais speciosa*, *Purpura patula pansa*, *Conus brunneus*, *C. purpurascens* and *C. virgatus*. These are essentially the same species McLEAN (1961) also reported to be absent from Los Angeles Bay.

### SYSTEMATIC ACCOUNT

The following format is adopted:

1. The order in the checklist, the nomenclature, and the species number is that given by KEEN (1958). References to species listed by KEEN may be located in her bibliography. References to species proposed since 1958 are included in the present paper.
2. The habitat and relative abundance of species found at Bahías Gonzaga and Willard are given. The species referred to as beach shells were not found living by us. The bathymetric ranges given by KEEN (1958) indicate many of these species live in deeper water.
3. The collecting stations referred to in the list by numbers are shown on the accompanying Map.
4. Range extensions are indicated by asterisks (\*) following the Keen numbers. The area from which the range is extended follows the collector's initial.
5. The following collectors are designated by initials:
 

Joseph and Helen DuShane .....	D
Faye B. Howard .....	H
Homer P. King .....	K
James R. Lance .....	L
James H. McLean .....	M
Gale Sphon .....	S

The specimens collected by Howard, King and Sphon are in the Santa Barbara Museum of Natural History. The DuShanes and Lance maintain private collections. Specimens collected by McLean are in the Los Angeles County Museum of Natural History.

### ACKNOWLEDGMENTS

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#### ECOLOGICAL NOTES ON FOURTEEN COLLECTING AREAS

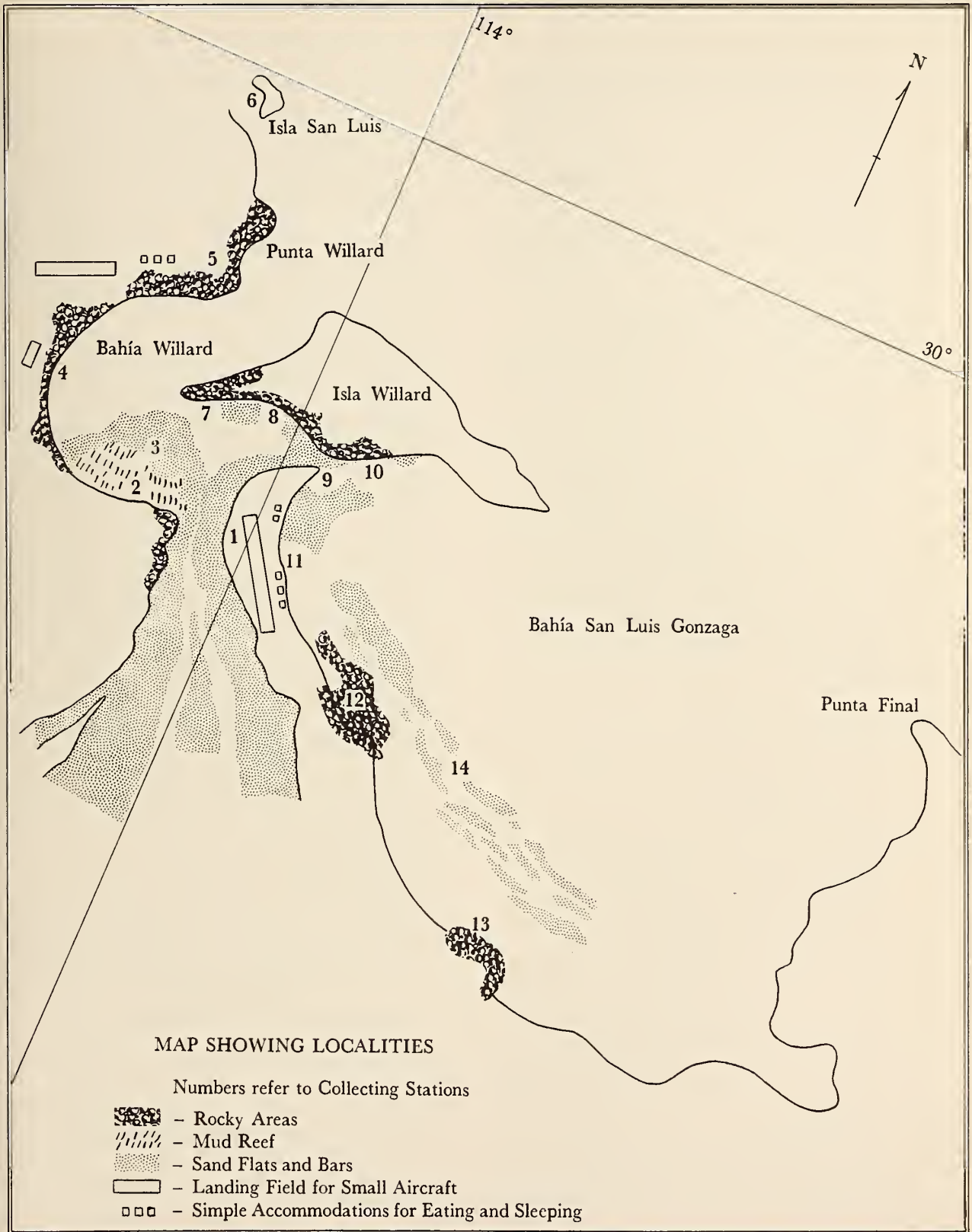
(see Map)

1. A low lying drainage channel bordered by *Salicornia*: two species of *Melampus* are in the mud at the roots of these plants.
2. A flat mud covered rock shelf: *Crassispira nymphia* and *C. pluto* are abundant. Large specimens of *Lithophaga attenuata* have bored into the rock.
3. Silty mud flats in the southern half of Willard Bay: *Laevicardium elatum*, *Oliva* spp., *Conus* spp., *Nassarius* spp., *Polinices* spp., and *Cassis ientiquadrata* are common. *Heterodonax bimaculata* is abundant in the upper littoral zone.
4. Rocky shore line with turnable rocks: *Barbatia*, *Lima*, *Crucibulum*, *Murex*, and *Strombus* are common.
5. Rocky shore in an exposed area: only the hardier forms are found, such as *Acmaea*, chitons, and *Acanthina*. Specimens of *Cypraea cervinetta* have been taken here. *Coralliophila costata* and *Modulus disculus* are on the rocks.
6. The largest of a six-island archipelago. Limited dredging here has corroborated the report of the 1921 expedition of the California Academy of Sciences to Isla San Luis.
7. A sheltered cove interspersed with boulders and sandy beaches: *Pecten circularis* and *Lima tectrica* are under and around the rocks. *Ostrea palmula* is attached to the rocks in the high intertidal zone.
8. The south side of Willard Island: this is a protected, rocky shore line with small to medium sized rocks broken by a few flat mud areas. The underside of rocks is an excellent location for nudibranchs, chitons, and *Mitra solitaria*. *Pteropurpura erinaceoides* and *Cymatium gibbosum* cling to the rocks at low tide.
9. Sand spit connecting the shore of Gonzaga Bay to Willard Bay and Willard Island: at low tide the spit is exposed, making it possible to walk to the island. At high tide a depth of 4 m of water has been reported. The outgoing tides create shifting sand bars where *Terebra* spp. and *Conus ximenes* are half buried. This is also the area where *Tivela stultorum* has been introduced (SHASKY, 1961; DUSHANE, 1966).
10. The south side of Willard Island, east of the sand spit and fronting on Gonzaga Bay: a rocky precipitous shore line with rough water. *Opalia diadema*, *Tenaturris carissima* and *Mitra solitaria* are under rocks. *Acmaea turveri* are attached to rocks in the upper littoral, while *A. strongiana* and *Nomaeopelta dalliana* are on the rocks in the mid-tide zone.
11. A steep beach which is actually a continuation of the sand spit: not particularly productive, although *Laevicardium elatum* and *Dosinia ponderosa* are common.
12. A rock reef area with tide pools: the tide pools occur in the upper intertidal zone. *Crucibulum imbricatum*, *Anadara multicostata*, and *Haminoea strongi* are common.
13. A rocky headland with medium size rocks: *Cypraea annettae*, *Arcopsis solida*, and *Isognomon chemnitzianus* are under and attached to rocks.
14. A sand bar area parallel to numbers 12 and 13: this is the low intertidal zone with extensive sand bars. *Cassis centiquadrata*, *Oliva spicata*, and *Terebra variegata* are abundant.

#### PELECYPODA

- 36 *Arca mutabilis* (SOWERBY, 1833). Common (5), under rocks (H, K, S).
- 37 *Arca pacifica* (SOWERBY, 1833). Uncommon (4, 5, 7), adhering to underside of rock ledge, low intertidal zone (H, K).
- 38\* *Barbatia lurida* (SOWERBY, 1833). Uncommon (10), attached to underside of rocks; Espíritu Santo Island, Gulf of California (K, M).
- 39 *Barbatia bailyi* (BARTSCH, 1931). Rare (10), beach specimen (H).
- 40\* *Barbatia gradata* (BRODERIP & SOWERBY, 1829). Uncommon (5), attached to underside of rocks; Scammon's Lagoon, Lower California to Peru (K).
- 43 *Barbatia reeveana* (ORBIGNY, 1846). Common (4, 5, 7, 8), attached between rocks (D, H, K, M, S).
- 44 *Barbatia illota* (SOWERBY, 1833). Uncommon (4, 8, 10), attached to rocks (D, H, K).





- 46 *Arcopsis solida* (SOWERBY, 1833). Common (5, 13), attached to underside of rocks (D, H, K, M, S).
- 57 *Anadara multicostata* (SOWERBY, 1833). Common (4, 12, 13), between rocks in low intertidal zone (D, K, S).
- 60\* *Anadara cepoides* (REEVE, 1844). Rare, beach specimen; Cerralvo Island, Gulf of California to Panama (H).
- 69\* *Noetia reversa* (SOWERBY, 1833). Rare (3); beach specimen; Concepcion Bay, Gulf of California to Peru (K).
- 72 *Glycymeris bicolor* (REEVE, 1843). Rare (3, 10), lying free in sandy runnels (D, H, M).
- 74 *Glycymeris gigantea* (REEVE, 1843). Rare alive, beach valves common (3), partially buried on silty mud flats (H, K, S).
- 75 *Glycymeris maculata* (BRODERIP, 1832). Common (3, 9, 11, 14), partially buried on sand bars (D, H, K, M, S).
- 76 *Glycymeris multicostata* (SOWERBY, 1833). Uncommon (3), partially buried on sand flats (H, K).
- 77 *Glycymeris tessellata* (SOWERBY, 1833). Rare (3), partially buried on silty mud flats (S).
- 83 *Hormomya adamsiana* (DUNKER, 1857). Common (7, 8), attached to underside of rocks (H, S).
- 86\* *Mytella speciosa* (REEVE, 1857). Rare (11), buried in sandy runnel; Magdalena Bay to Peru (D).
- 88 *Crenella divaricata* (ORBIGNY, 1853). Rare; beach specimen (H).
- 90 *Lithophaga aristata* (DILLWYN, 1817). Common (5), boring in rock (H, K).
- 91\* *Lithophaga attenuata* (DESHAYES, 1836). Common (2, 5), boring in mud-covered rock ledge; Costa Rica to Chile (D, K, S).
- 95 *Lithophaga spatiosa* (CARPENTER, 1856). Common (2), boring in mud-covered rock ledge (S).
- 99\* *Gregariella denticulata* (DALL, 1871). Common (8), boring in soft rock; Acapulco, Mexico (H).
- 101 *Modiolus capax* (CONRAD, 1837). Common (2), on mud-covered rock ledge (S).
- 107 *Pteria sterna* (GOULD, 1851). Rare; beach specimen (H).
- 111 *Pinna rugosa* SOWERBY, 1855. Uncommon (4, 5), among rocks, low intertidal zone (K).
- 115 *Isognomon chemnitzianus* (ORBIGNY, 1853). Common (7, 8, 10, 13), attached to underside of rocks (H, K, M, S).
- 124 *Ostrea palmula* CARPENTER, 1857. Common (4, 7), attached to rocks in the high intertidal zone (K, S).
- 126 *Pecten vogdesi* ARNOLD, 1906. Rare living, beach valves common (3), on sand and gravel flats (D, H).
- 128 *Aequipecten palmeri* (DALL, 1897). Rare; beach specimen (H).
- 132 *Aequipecten circularis* (SOWERBY, 1835). Uncommon (5, 7, 8), around and under rocks intertidally (D, H, K, S).
- 137 *Lyropecten subnodosus* (SOWERBY, 1835). Rare (5, 7), among small rocks (H, K, S).
- 140 *Lima tetrica* GOULD, 1851. Rare (4, 7), under rocks (D, H, K).
- 141 *Lima hemphilli* HERTLEIN & STRONG, 1946. Rare (4, 7), under rocks (H, K).
- 146 *Spondylus calcifer* CARPENTER, 1857. Uncommon (5), on rocks (K).
- 147 *Plicatula anomiooides* KEEN, 1958. Uncommon (5), under rocks (H, K).
- 152 *Anomia peruviana* ORBIGNY, 1846. Rare (4), on rocks (K).
- 162 *Cardita affinis* SOWERBY, 1833. Common (3, 4, 10), under rocks and on silty mud flats (D, H, K, M, S).
- 163 *Cardita crassicostata* (SOWERBY, 1825). Rare (7, 8), among rocks on Willard Island, intertidally (D, K, S).
- 186 *Lucina lingualis* CARPENTER, 1864. Rare; valves only (H).
- 200 *Codakia distinguenda* (TRYON, 1872). Uncommon (5), in very shallow water at low tide (H, K).
- 205 *Ctena mexicana* (DALL, 1901). Common (14), lying on sand bars (H, S).
- 206 *Divalinga eburnea* (REEVE, 1850). Uncommon (14), partially buried on sand bars (H).
- 210 *Diplodonta subquadrata* CARPENTER, 1856. Common (10), among rocks (M, S).
- 212 *Diplodonta sericata* (REEVE, 1850). Common (3), on mud flats at edge of sting ray basins (D, H, S).
- 213 *Diplodonta caelata* (REEVE, 1850). Rare (2), in pholad holes (H).
- 214 *Diplodonta semirugosa* DALL, 1899. Rare (3), on mud flats (D, S).
- 217 *Aligena nucea* DALL, 1913. Rare; single worn valve (H).
- 224\* *Lasaea subviridis* DALL, 1899. Rare; in the coils of a vermetid; Shelter Cove, California to Cape San Lucas, Lower California (H).
- 236 *Solecardia eburnea* CONRAD, 1849. Uncommon (14), on sand bars (D).
- 238 *Chama buddiana* C. B. ADAMS, 1852. Common (4, 5, 7), attached to rocks (H, K, S).
- 240a\* *Chama frondosa mexicana* CARPENTER, 1857. Uncommon (2), on mud covered rock reef; Guaymas to Panama and Ecuador (D, H, S).
- 243 *Chama venosa* REEVE, 1847. Uncommon (8), on rocks (H).



- 247\* *Pseudochama panamensis* (REEVE, 1847). Uncommon (5), on rocks; Panama (H, K).
- 248 *Pseudochama saavedrai* HERTLEIN & STRONG, 1946. Uncommon (4), on rocks (K).
- 252 *Trachycardium panamense* (SOWERBY, 1833). Common (3, 14), on silty mud flats and sand bars (D, H, K, S).
- 255 *Papyridea aspersa* (SOWERBY, 1833). Common (3), on silty mud flats (D, H, K, S).
- 256 *Trigoniocardia granifera* (BRODERIP & SOWERBY, 1829). Rare (14), partially buried on sand flats (S).
- 258 *Trigoniocardia biangulata* (BRODERIP & SOWERBY, 1829). Common (3, 11, 12, 13), on sand flats and along sand beach (D, H, K, S).
- 262 *Laevicardium elatum* (SOWERBY, 1833). Common (3, 10, 11, 12, 13, 14), rolling in on low tide and partially buried in sand (D, H, K, M, S).
- 263 *Laevicardium elenense* (SOWERBY, 1840 [? 1841]). Common (3, 14), on silty mud flats and on sand bars (D, H, K, S).
- 280 *Transennella puella* (CARPENTER, 1864). Uncommon (8, 9, 10), sand flats (M, S).
- 282 *Transennella tantilla* (GOULD, 1853). Uncommon; under rocks (S).
- 284\* *Pitar consanguineus* (C. B. ADAMS, 1852). Rare; valves only; Port Guatulco, Mexico (H).
- 286 *Pitar newcombianus* (GABB, 1865). Uncommon (3), on silty mud flats (H).
- 303 *Megapitaria squalida* (SOWERBY, 1835). Common (3, 9, 10, 13), partially buried on sand bars (D, H, K, M, S).
- 305 *Dosinia dunkeri* (PHILIPPI, 1844). Uncommon (14), partially buried in sand bars (H, K).
- 306 *Dosinia ponderosa* (GRAY, 1838). Common (14), partially buried in sand bars (D, H, K, S).
- 318 *Chione californiensis* (BRODERIP, 1835). Common (3, 9), on silty mud flats and sand bars (D, M).
- 319 *Chione compta* (BRODERIP, 1835). Uncommon (3), partially buried on mud flats and in runnels (D).
- 320 *Chione guatulcoensis* HERTLEIN & STRONG, 1948. Uncommon; on silty mud flats (D).
- 321 *Chione undatella* (SOWERBY, 1835). Uncommon (11, 12), on sand beach (D, H).
- 328 *Chione purpurissata* DALL, 1902. Rare (9, 10), partially buried on sand beach (D, M).
- 335 *Chione picta* WILLETT, 1944. Uncommon (8), among rocks (S).
- 337 *Anomalocardia tumens* (VERRILL, 1870). Rare (9, 11), on sand beach (D, H).
- 340 *Protothaca grata* (SAY, 1831). Common (3), silty mud flats (K).
- 341 *Protothaca asperrima* (SOWERBY, 1835). Uncommon (3), silty mud flats (S).
- 347 *Petricola denticulata* SOWERBY, 1834. Common (2), boring in soft, rocky ledges (D, H, K).
- 355 *Mactra dolabriformis* (CONRAD, 1867). Uncommon (14), partially buried on sand bars (S).
- 408 *Tellina pristiphora* DALL, 1900. Rare; beach specimens (K).
- 422\* *Apolymetis cognata* (PILSBRY & VANATTA, 1902). Rare; beach specimens; Nicaragua (H).
- 423 *Apolymetis cognata clarki* DURHAM, 1950. Rare; beach specimens (H).
- 450 *Donax gracilis* HANLEY, 1845. Common (14), partially buried on sand bars (D, S).
- 455 *Donax punctatostratus* HANLEY, 1843. Uncommon (14), on sand bars (H).
- 466 *Gari regularis* (CARPENTER, 1864). Uncommon (11), sand beach (D, H, S).
- 467 *Heterodonax bimaculatus* (LINNAEUS, 1758). Common (3, 10, 12, 13), high tide zone, sand beach (D, H, K, M, S).
- 471 *Tagelus californianus* (CONRAD, 1837). Uncommon (3), silty mud flats (K).
- 475 *Tagelus politus* (CARPENTER, 1857). Rare (3), on silty mud flats (D, H).
- 477 *Semele bicolor* (C. B. ADAMS, 1852). Rare; beach specimen (H).
- 481 *Semele flavescens* (GOULD, 1851). Uncommon (10), among rocks (H, M).
- 483 *Semele guaymasensis* PILSBRY & LOWE, 1932. Rare (8), around rocks (S).
- 489 *Semele pacifica* DALL, 1915. Rare; beach specimens (H).
- 508 *Cumingia lamellosa* SOWERBY, 1833. Uncommon (6, 12, 13), among rocks (D, H, S).
- 512 *Solen mexicanus* DALL, 1899. Uncommon (3), silty mud flats (H).
- 521 *Sphenia fragilis* (H. & A. ADAMS, 1854) (*teste* KEEN). Rare (8), under rocks (S).
- 523 *Corbula bicarinata* SOWERBY, 1833. Uncommon (7), under rocks (D, S).
- 542 *Hiatella arctica* (LINNAEUS, 1767). Common (4, 5, 7, 8), under rocks (H, K, S).
- 578 *Lyonsia gouldii* DALL, 1915. Rare (9), partially buried on sand spit (H).
- 590 *Thracia squamosa* CARPENTER, 1856. Rare (2), in pholad holes (H).
- 593 *Cyathodonta dubiosa* DALL, 1915. Rare; beach specimen (H).
- 594 *Cyathodonta lucasana* DALL, 1915. Rare; beach specimen (H).
- 595 *Cyathodonta undulata* CONRAD, 1849. Rare; beach specimen (H).

## GASTROPODA

- 10 *Acmaea semirubida* DALL, 1914. Rare (3), intertidally, attached to dead *Cardita crassicostata* (SOWERBY, 1825); dredged 11 m, common (6), (D).
- 12a *Acmaea strongiana* HERTLEIN, 1958. Common (8, 10), on rocks at midtide zone (D, H, M, S).
- 14 *Acmaea turveri* HERTLEIN & STRONG, 1951. Common (8), on rocks in high intertidal zone (D, H, S).
- 16 *Nomaeopelta dalliana* (PILSBRY, 1891). Common (7, 8), on rocks at midtide zone (D, H, K, S).
- 18 *Nomaeopelta stanfordiana* (BERRY, 1957). Rare (8, 10), beach specimens (H, M).  
*Lucapinella milleri* BERRY, 1959 (p. 109). Uncommon (8), attached to underside of rocks (D, H).
- 30 *Diodora alta* (C. B. ADAMS, 1852). Uncommon (7, 8), under rocks (D, H, S).
- 32 *Diodora inaequalis* (SOWERBY, 1835). Common (5, 7, 8, 10), under rocks (D, H, K, M, S).
- 32a *Diodora digueti* MABILLE, 1895. Uncommon (5, 7, 8), under rocks (D).
- 34 *Diodora saturnalis* (CARPENTER, 1864). Rare; beach specimen (H).  
*Diodora pusilla* BERRY, 1959 (p. 109). Common (6), dredged 7 fms. (D).
- 38 *Calliostoma* cf. *C. angelenum* LOWE, 1935. Rare; beach specimen (H).
- Tegula* sp. Under rocks (8, 10), common (H, M, S).
- 54 *Tegula mariana* DALL, 1919. Common (8, 10), under and around rocks (H, M).
- 58 *Tegula rugosa* (A. ADAMS, 1853). Common (5, 7, 8, 10, 12, 13), on rocks (D, H, K, M, S).
- 64 *Turbo fluctuosus* WOOD, 1828. Uncommon (8, 10), among rocks (H, K, M).
- 68 *Turbo squamiger* REEVE, 1843. Uncommon (6), dredged in 11 m (D).  
*Tricolia typica* (DALL, 1908). Common (6), dredged in 11 m (D).
- 81 *Nerita scabricosta* LAMARCK, 1822. Rare (5), on rocks (H).
- 82 *Nerita funiculata* MENKE, 1851. Common (5, 8, 10), on rocks in high tide area (H, M, S).
- 83 *Neritina luteofasciata* MILLER, 1879. Uncommon (3), in runnels on silty mud flat (H).
- 87 *Niso excolpa* BARTSCH, 1917. Beach specimen (D).
- 90 *Epitonium acapulcanum* DALL, 1917. Uncommon (7), on *Cardita crassicostata* (SOWERBY, 1825) (D).
- 124 *Epitonium oerstedianum* HERTLEIN & STRONG, 1951. Beach specimen (H).
- 158 *Opalia diadema* (SOWERBY, 1832). Uncommon (10), under rocks on west side of Willard Island (D, H).
- 175a *Littorina dubiosa penicillata* CARPENTER, 1864. Common (7), on rocks (H).

## Explanation of Plate 35

Figure 1a, 1b: *Cyclostrema spiceri* BAKER, HANNA & STRONG, 1938. Holotype, California Academy of Sciences Paleo. Type Collection 5462 (x 15.5). Greatest diameter 3.97 mm; least diam. 2.93 mm; alt. 2.2 mm. Type locality: Coyote Bay, Concepcion Bay, Lower California, Mexico, in about 2 fathoms.

Figure 2: *Terebra berryi* CAMPBELL, 1961. Holotype: Calif. Acad. Sci. Paleo. Type Coll. 12352 (x 2). Length 32 mm; width 7 mm. Type locality: Puertecitos, Lower California, Mexico.

Figure 3: *Triphora hannai* BAKER, 1926. Holotype, Calif. Acad. Sci. Paleo. Type Coll. 2136 (x 10). Length 8.17 mm; diam. 2.43 mm. Type locality: San Francisco Island, Gulf of California, Mexico.

Figure 4: *Lamellaria sharonae* WILLET, 1939. Holotype: Los Angeles County Mus. Nat. Hist. 1059 (x 3.5). Max. diam. 5.5 mm; alt. 7.4 mm. Type locality: Anaheim Bay, Orange County, California.

Figure 5: *Diodora pusilla* BERRY, 1959. Holotype: Stanford Univ. Paleo. Type Coll. 8587 (x 3). Long. 3.8 mm; lat. 2.5 mm; alt. 3.6 mm. Type locality: 6 - 10 fathoms, off Acapulco, Guerrero, Mexico.

Figure 6: *Retusa gonzagensis* BAKER & HANNA, 1927. Holotype: Calif. Acad. Sci. Paleo. Type Coll. 2519 (x 9). Length 2.9 mm; diam. 1.6 mm. Type locality: San Luis Gonzaga Bay, Gulf of California, Mexico.

Figure 7: *Lucapinella milleri* BERRY, 1959. Holotype: Stanford Univ. Paleo Type Coll. 8588 (x 3.5). Long. 8.6 mm; lat. 4.6 mm; alt. 1.4 mm; diam. of foramen at center 1.3 mm. Type locality: Puertecitos, Lower California, Mexico.

Figure 8: *Melampus mousleyi* BERRY, 1964. Holotype: Stanford Univ. Paleo. Type Coll. 9503 (x 3). Alt. 10 mm; diam. 5.4 mm. Type locality: Cholla Cove, Bahía de Adair, Sonora, Mexico.

Figure 9a, 9b: *Aspella bakeri* HERTLEIN & STRONG, 1951. Holotype: Calif. Acad. Sci. Paleo. Type Coll. 5893 (x 1.3). Length 18 mm; diam. 8 mm. Type locality: Agua Verde Bay, Gulf of California, Mexico.

Figure 10: *Epitonium oerstedianum* HERTLEIN & STRONG, 1951. Holotype: Calif. Acad. Sci. Paleo Type Coll. 9622 (x 8). Length 6.5 mm; diam. 4.2 mm. Type locality: Off San Domingo Point, Santa Inez Bay, Gulf of California, Mexico.

Figure 11: *Coralliophila incompta* BERRY, 1960. DuShane Coll. Length 23 mm; diam. 14 mm. Holotype: Berry Coll. 18768; length 33.5 mm; diam. 20.3 mm. Type locality: Puerto Refugio, Angel de la Guarda Island, Gulf of California, Mexico.

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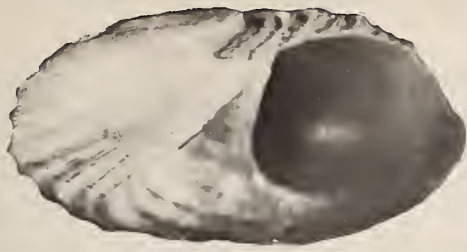


Figure 1 a

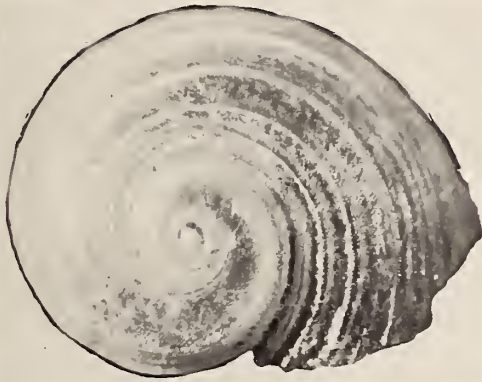


Figure 1 b



Figure 2

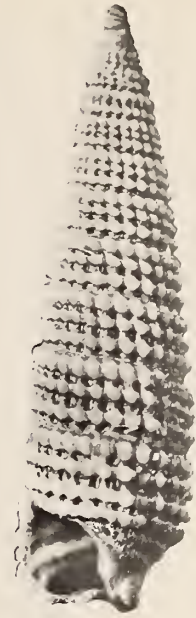


Figure 3



Figure 4

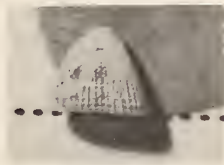


Figure 5



Figure 6



Figure 7



Figure 8



Figure 9 a



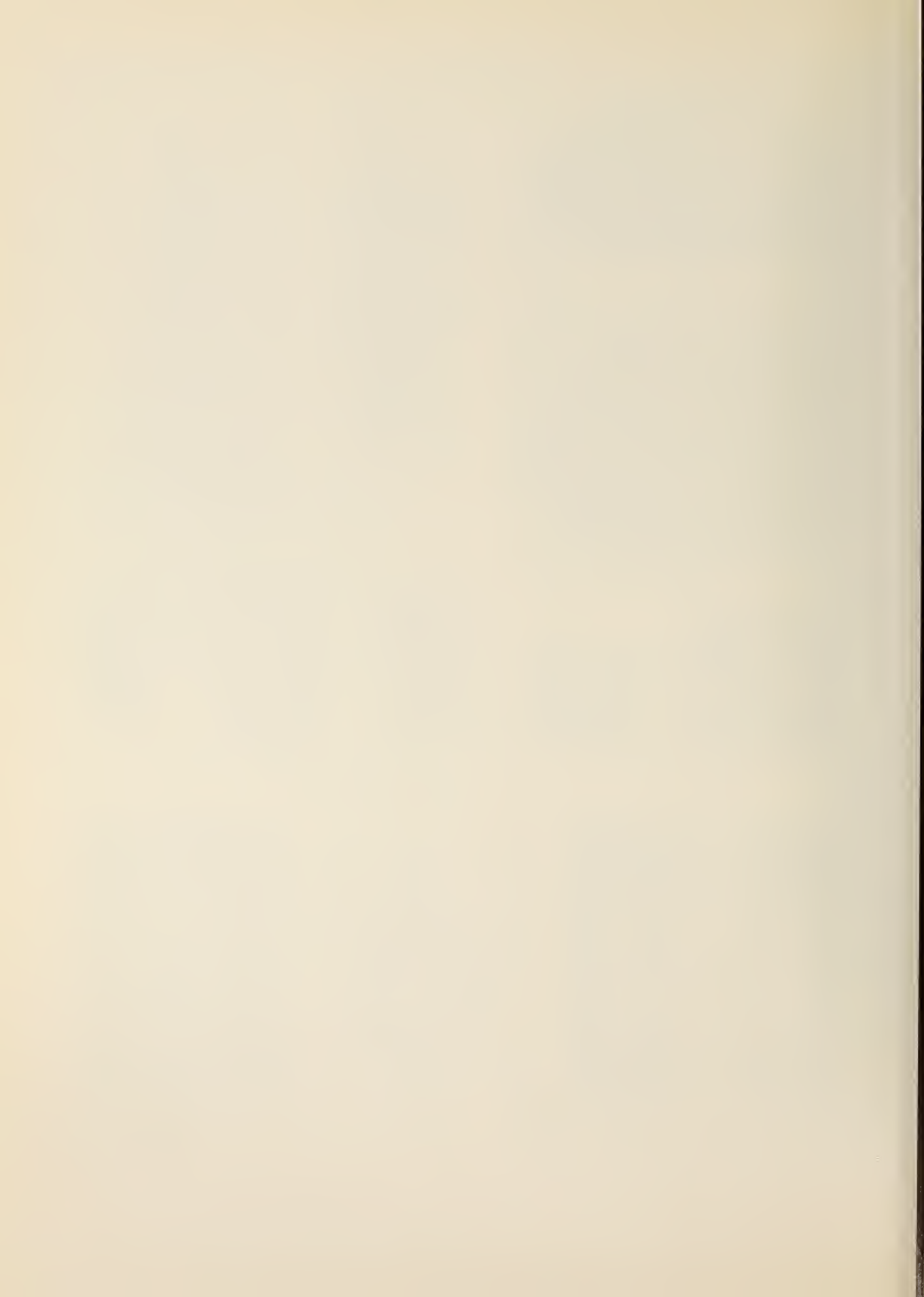
Figure 9 b



Figure 10



Figure 11





- \* *Cyclostrema spiceri* BAKER, HANNA & STRONG, 1938 (p. 234). Beach specimen (10); Concepcion Bay, Gulf of California (M).  
*Truncatella bairdiana* (C. B. ADAMS, 1852) (p. 437). Uncommon (8, 10), under rocks on west side of Willard Island (D, H, M, S).
- \* *Rissoina burragei* BARTSCH, 1915 (p. 28). Uncommon (8, 10), under rocks; Los Angeles Bay, Gulf of California (McLEAN, 1961), (D, M, S).
- \* *Rissoina barthelowi* BARTSCH, 1915 (p. 28). Dredged in 11 m (6); Concepcion Bay, Gulf of California and Guaymas, Mexico (DUSHANE & POORMAN, 1967), (D).
- \* *Rissoina stricta* (MENKE, 1850) (p. 161). Dredged in 11 m (6); Guaymas, Mexico (DUSHANE & POORMAN, 1967), (D).
- \* *Rissoina zeltneri* DEFOLIN, 1867. Rare, Beach specimens; Panama (H).
- \* *Alvania monserratensis* BAKER, HANNA & STRONG, 1930 (p. 27). Beach specimens; Monserrate Island, Gulf of California (H).
- \* *Barleeia polychroma* (DEFOLIN, 1870). Rare (8), under rocks; Panama (H).
- 185 *Turritella leucostoma* VALENCIENNES, 1832. Rare (11), beach specimens (H).
- 189a *Vermicularia pellucida eburnea* (REEVE, 1842). Common (7, 8, 10, 11, 12, 13), under rocks (D, H, S)
- 193 *Heliacus bicanaliculatus* (VALENCIENNES, 1832). Uncommon (3, 5), on muddy sand reef and among compound ascidians in low intertidal zone (D, H, K).  
*Caecum* sp. Rare, attached to live *Cardita crassicotata* (SOWERBY, 1825), (D).
- \* *Elephantulum liratoincta* (CARPENTER, 1857) (p. 317). Uncommon (8), in sand; Panama (D, S).
- \* *Elephantanellum heptagonum* (CARPENTER, 1857) (p. 319). Uncommon (8), in sand; Bahía de Los Angeles, Gulf of California (D, S).
- 196 *Modulus cerodes* (A. ADAMS, 1851). Rare (3, 8, 12), on silty mud flats and among rocks (D, H, K).
- 197 *Modulus disculus* (PHILIPPI, 1846). Common (3, 5, 8, 12, 13), on silty mud flats and among rocks (D, H, K, M, S).
- 198 *Vermetus centiquadrus* VALENCIENNES, 1846 (*teste* KEEN). Uncommon (8), under rocks (H).
- 199\* *Petalococonchus* cf. *P. complicatus* DALL, 1908. Common (5), on rock; Cocos Island, Panama (H).
- 200a\* *Petalococonchus flavescens* (CARPENTER, 1857). Common (5), on rocks; Guaymas to Mazatlan, Mexico (H).
- 201 *Vermetus indentatus* (CARPENTER, 1856), (*teste* KEEN). Common (5), on rocks (H).
- 203 *Petalococonchus macrophragma* CARPENTER, 1865. Beach specimen (H).
- 204 *Serpulorbis* cf. *S. eruciformis* (MÖRCH, 1862). Rare (8), on rocks (H).
- 208 *Vermetus tripsycha* PILSBRY & LOWE, 1932. Uncommon (8), on rocks (H).
- 214 *Cerithium sculptum* SOWERBY, 1855. Common (4, 5, 10), around rocks (H, K, M).
- 215 *Cerithium stercusmuscarum* VALENCIENNES, 1833. Common (10), around rocks (H).
- 216 *Cerithium uncinatum* (GMELIN, 1791). Rare (8), around rocks in low intertidal zone (D).
- \* *Triphora hannai* BAKER, 1926 (p. 225). Dredged in 11 m (6); San Francisco Island, Gulf of California (D).
- \* *Triphora oweni* BAKER, 1926 (p. 232). Dredged in 11 m (6); San Francisco Island, Gulf of California (D).
- \* *Triphora panamensis* (BARTSCH, 1907) (p. 249). Rare (8), under rocks; Panama (S).  
*Metaxia convexa* (CARPENTER, 1857) (p. 444). Dredged in 11 m (6), (D).  
*Scila assimilata* (C. B. ADAMS, 1852) (p. 374). Uncommon (8), under rocks (H, S).
- \* *Alaba interruptilineata* PILSBRY & LOWE, 1932 (p. 81). Uncommon (8, 10), under rocks (see McLEAN 1961; DUSHANE 1962), (D, M, S).
- \* *Alaba supralirata* CARPENTER, 1857 (p. 366). Rare (8), under rocks; Bahía de Los Angeles, Gulf of California (H).  
*Alabina diomedea* (BARTSCH, 1911) (p. 413). Uncommon (7, 10), under rocks (D, M, S).
- \* *Alabina monicensis* (BARTSCH, 1911) (p. 409). Uncommon (7, 10), under rocks; Santa Monica, California (S).  
*Alabina tenuisculpta* (CARPENTER, 1864) (p. 517). Uncommon (7, 10), under rocks (S).
- 220 *Cerithidea mazatlanica* CARPENTER, 1857. Common (1), under *Salicornia* bushes on mud flats (D, H, K, M, S).
- 224 *Rhinocoryne humboldti* (VALENCIENNES, 1832). Rare, beach specimens (H).
- 227 *Hipponix pilosus* (DESHAYES, 1832). Uncommon (5), on rocks (H).
- 229 *Hipponix serratus* CARPENTER, 1857. Rare (10), beach specimen (H, M).
- 233 *Calyptrea mamillaris* BRODERIP, 1834. Uncommon (3), beach specimens (H).
- 240 *Crepidula arenata* (BRODERIP, 1834). Common (8), attached to rocks (H, S).
- 241 *Crepidula excavata* (BRODERIP, 1834). Common (7, 8), attached to rocks and shells (S).

- 242 *Crepidula incurva* (BRODERIP, 1834). Common (3, 10, 13), living on other shells (H, S).
- 243 *Crepidula lessonii* (BRODERIP, 1834). Uncommon (8, 12), under rocks (S).
- 245 *Crepidula onyx* SOWERBY, 1824. Common (3, 5, 10, 13), on beach shells (H, K, M, S).
- 248 *Crepidula striolata* MENKE, 1851. Common (5), living on other shells (H, K).
- 252 *Crucibulum scutellatum* (WOOD, 1828). Common (3, 4, 12, 13), attached to rocks (D, H, K, S).
- 254 *Crucibulum spinosum* (SOWERBY, 1824). Common (4, 7, 10, 12, 13), attached to rocks (D, H, K, M, S).
- 258 *Natica chemnitzii* PFEIFFER, 1840. Common (3, 12, 14), on silty mud flats and sand bars (D, H, K, S).
- 266 *Polinices bifasciatus* (GRAY, 1834). Common (3, 10, 14), on silty mud flats and sand bars (D, H, K, M, S).
- 272 *Polinices uber* (VALENCIENNES, 1832) Common (3, 10, 14), on silty mud flats and sand bars (D, H, K, M, S).
- 274 *Polinices reclusianus* (DESHAYES, 1839). Common (3, 4, 9, 14), on silty mud flats and sand bars (D, K, S).
- 275 *Sinum debile* (GOULD, 1853). Rare (3), partially buried on silty mud flat (S).
- 276\* *Sinum noyesii* DALL, 1903. Rare (3), partially buried on silty mud flat; Nicaragua to Panama (S).
- 280 *Lamellaria inflata* (C. B. ADAMS, 1852). Common (8), under rocks (D, S).
- \* *Lamellaria sharonae* WILLETT, 1939 (p. 123). Rare (8), under rocks; Anaheim Bay, Orange County, California (S). Original spelling *L. "sharoni"* emended by BURCH (1946) to *L. sharonae*.
- 283 *Cypraea cervinetta* KIENER, 1843. Under rocks (5), [collected by Phillips, Santa Barbara, November, 1966].
- 287 *Cypraea annettae* DALL, 1909. Common (4, 5, 7, 8, 13), attached to underside of rocks (D, H, K, S).
- 289 *Erato columbella* MENKE, 1847. Uncommon (8, 10), attached to underside of rocks (D, H, M, S).
- 296 *Trivia californiana* (GRAY, 1828). Uncommon (5, 7, 8), under and on rocks (H, K, S).
- 297 *Trivia radians* (LAMARCK, 1810). Beach specimens (5, 12), (K).
- 299 *Trivia solandri* (SOWERBY, 1832). Uncommon (5, 7, 8), under and on rocks (H, K, S).
- 300 *Jenneria pustulata* (LIGHTFOOT, 1786). Uncommon (5, 8), under rocks (H, K, S).
- 307 *Strombus galeatus* SWAINSON, 1823. Uncommon (4, 8), in sand next to rocks (H, K, S).
- 308 *Strombus gracilior* SOWERBY, 1825. Uncommon (3, 4, 11, 12), partially buried in sand (D, H, K, S).
- 309 *Strombus granulatus* SWAINSON, 1822. Common (3, 4, 7, 10), on silty mud flats and around rocks (D, H, K, M, S).
- 315 *Cassis centiquadrata* (VALENCIENNES, 1832). Uncommon (3, 14), on silty mud flats and sand bars (D, H, K, S).
- 324 *Cymatium gibbosum* (BRODERIP, 1833). Uncommon in February, common in late spring and early summer (4, 5, 7, 8, 12, 13), on rocks (D, H, K, S).
- 335 *Murex elenensis* DALL, 1909. Uncommon (3, 4, 5), on rocks (H, K, S).
- 339 *Hexaplex erythrostomus* (SWAINSON, 1831). Uncommon in February, common in May (3, 4, 5), on silty mud flats and around rocks (D, H, K, S).
- 344 *Muricanthus nigrinus* (PHILIPPI, 1845). Uncommon in February, common in May (3, 5), on tidal flats and among rocks (D, H, K, M, S).
- 348 *Pteropurpura erinaceoides* (VALENCIENNES, 1832). [see EMERSON, 1964, p. 5]. Common (5, 7, 8, 12, 13), on top and sides of rocks (D, H, K, S).
- 375\* *Aspella bakeri* HERTLEIN & STRONG, 1951. Dredged in 11 m (6); Agua Verde Bay, Gulf of California (D).
- 387 *Coralliophila costata* (BLAINVILLE, 1832). Uncommon (2, 5, 12, 13), on top of rocks (D, K).
- 388 *Coralliophila hindsi* (CARPENTER, 1857). Rare (5), on rocks (H).
- Coralliophila incompta* BERRY, 1960. Uncommon (6); 11 m (D).
- 398 *Thais biserialis* (BLAINVILLE, 1832). Common (4, 5, 7, 8, 12, 13), on rocks (D, H, S).
- 404 *Acanthina angelica* I. OLDROYD, 1918. Common (4, 5, 7, 8, 10, 12, 13), on rocks at high tide level (D, K, M, S).
- 409 *Acanthina tuberculata* (SOWERBY, 1835). Common (4, 5, 7, 8, 10, 12, 13), on rocks (D, H, K, M, S).
- 411 *Morula ferruginosa* (REEVE, 1846). Common (7, 8, 10, 12, 13), intertidally under rocks (D, H, M, S).
- 412 *Morula lugubris* (C. B. ADAMS, 1852). Uncommon (8), intertidally under rocks (H).
- \* *Decipifus gracilis* McLEAN, 1959. Uncommon (8), under rocks; Bahía de los Angeles, Baja California (D, S).
- Decipifus* spec. nov. Uncommon (8), under rocks (D, S).
- 424 *Anachis coronata* (SOWERBY, 1832). Uncommon (5, 8, 10, 13), under rocks; dredged in 11 m, common (6), (D, H, K, M, S).
- 433\* *Anachis* cf. *A. taeniata* PHILIPPI, 1846. Rare, beach specimens; west Mexican coast (H).



- 437 *Anachis hilli* PILSBRY & LOWE, 1932. Rare (8), under rocks on the west side of Willard Island (D).
- 444 *Anachis nigricans* (SOWERBY, 1844). Uncommon (5, 8), under rocks (H, K).
- 464 *Anachis varia* (SOWERBY, 1832). Uncommon (5, 8, 13), under rocks (D, H, K).
- 478 *Mitrella dorma* BAKER, HANNA & STRONG, 1938. Uncommon (8), intertidally under rocks (D, H).
- 482 *Mitrella lalage* PILSBRY & LOWE, 1932. Uncommon (8), intertidally under rocks (S).
- 484 *Mitrella guttata* (SOWERBY, 1832). [see HOWARD, 1963]. Common (4, 5, 7, 8), intertidally under rocks (D, H, M).
- 486 *Mitrella santabarbarensis* (CARPENTER, in GOULD & CARPENTER, 1857). Rare (10), intertidally under rocks (M).
- 490\* *Nassarina pammicra* PILSBRY & LOWE, 1932. Uncommon (8), clustered under rocks at sides of drainage channels; Bahía de Los Angeles, Gulf of California (D, S).
- 494 *Parametaria dupontii* (KIENER, 1849-1850). Uncommon (5, 8), on rocks (H, K).  
*Pyrene aureomexicana* HOWARD, 1963. Common (8, 10, 12, 13), under rocks (D, H, M, S).
- 508 *Strombina dorsata* (SOWERBY, 1832). Rare (2), on sandy mud reef (D, S).
- 512 *Strombina gibberula* (SOWERBY, 1832). Rare (2), on mud covered rock reef (S).
- 515 *Strombina maculosa* (SOWERBY, 1832). Common (3, 4, 10), on silty sand flats (D, H, K, M, S).
- 543 *Cantharus macrospira* (BERRY, 1957) (?) as "*Solenosteira anomala*." Common (3), on silty sand flats (D, H, K, S).
- 549 *Engina maura* (SOWERBY, 1832). Rare, beach specimen (H).
- 550a\* *Engina reevci* TRYON, 1883. Rare (8), on rocks; Southern Gulf of California, possibly south to Panama (H).
- 551 *Engina solida* (DALL, 1917). Rare, beach specimen (D).
- 567 *Melongena patula* (BRODERIP & SOWERBY, 1829). Rare (3), juvenile on silty mud flats (S).
- 587 *Nassarius versicolor* (C. B. ADAMS, 1852). Common (10, 14), on sand bars (D, H, M, S).
- 595 *Nassarius tiarula* (KIENER, 1841). Common (10, 14), on sand bars (D, H, M, S).
- 610 *Fusinus dupetitthouarsi* (KIENER, 1846). Rare, beach specimen (H).
- 612 *Fusinus ambustus* (GOULD, 1853). Common (2, 7, 8), on mud covered rock ledge (D, H, S).
- 618 *Fusinus felipensis* LOWE, 1935. Uncommon (8, 10, 13), under rocks (D, M, S).
- 620 *Oliva incrassata* (LIGHTFOOT, 1786). Common (3, 4, 14), partially buried in sand (D, H, K, S).
- 625 *Oliva spicata* (RÖDING, 1798). Common (3, 4, 14), partially buried in sand (D, H, K, S).
- 627 *Oliva undatella* LAMARCK, 1810. Common (11, 12, 13, 14), partially buried in sand bars (D, S).
- 634 *Olivella dama* (WOOD, 1828, ex MAWE MS.). Common (9, 10, 11, 12, 13, 14), partially buried in sand bars (D, H, K, M, S).
- 634a *Olivella fletcheri* BERRY, 1958. Common (11, 12, 13, 14), partially buried in sand bars (D, K, M, S).
- 645 *Olivella zanoeta* (DUCLOS, 1835). Uncommon (3, 12, 13), partially buried in sand flats (K).
- 646 *Mitra solitaria* C. B. ADAMS, 1858. Uncommon (8, 10), under rocks (D, H, M, S).
- 656 *Mitra tristis* BRODERIP, 1836. Common (2, 5, 12, 13), on mud covered rock reef (D, H, K, M, S).
- 659 *Mitra erythrogramma* TOMLIN, 1931. Uncommon (2), partially buried on sandy, mud covered rock ledge (D, S).
- 666 *Lyria eumingii* (BRODERIP, 1832). Uncommon (3, 4, 12, 13), on mud covered rock shelf (D, H, K, M, S).
- 669 *Volvarina taeniolata* (MÖRCH, 1860). Formerly *Marginella californica* TOMLIN, 1916 [see COAN & ROTH, 1966]. Common (4, 5, 7, 8, 13), under rocks (D, H, K, S).
- 685 *Cancellaria obesa* SOWERBY, 1832. Rare (3, 12), beach specimens (H, K).
- 693 *Cancellaria cassidiformis* SOWERBY, 1832. Rare (3, 12), beach specimens (K, S).
- 710 *Trigonostoma gonistoma* (SOWERBY, 1832). Uncommon (2, 5, 13), on mud covered rock shelf (D, H, K, M, S).
- 726 *Knefastia funiculata* (KIENER, 1839-1840, ex VALENCIENNES MS.). Uncommon, beach specimen (H).
- 727 *Knefastia olivacca* (SOWERBY, 1833). Rare (8), among rubble rocks (H).
- 728 *Knefastia tuberculifera* (BRODERIP & SOWERBY, 1829). Rare (2), on mud covered rock ledge (S).
- 746\* *Clavus acginus* (DALL, 1919). Rare (6), dredged in 11 m; Agua Verde Bay, Gulf of California (D).
- 753 *Clavus iantho* (DALL, 1919). Rare, beach specimen (S).
- 767\* *Clathrodrillia maura* (SOWERBY, 1834). Rare, beach specimen; Mazatlan, Mexico (D).
- 770 *Clathrodrillia aenonc* (DALL, 1919). Rare (2), on rocky reef (S).
- 807 *Crassispira flavonodosa* PILSBRY & LOWE, 1932. Rare (7), under rocks (D).
- 818\* *Crassispira* cf. *C. monilifera* (CARPENTER, 1857).

- Common (2, 8), on muddy rocky reef and under rocks; Mazatlan, Mexico to Panama (D, S).
- 822 *Crassispira nymphia* PILSBRY & LOWE, 1932. Common (2), on mud covered rocky reef (D, H, M, S).
- 825 *Crassispira pluto* PILSBRY & LOWE, 1932. Common (2), on mud covered rocky reef (D, S).
- 860\* *Mangelia finitima* (PILSBRY & LOWE, 1932). Rare (8, 10), under rocks; Guaymas, Mexico [see DUSHANE & POORMAN, 1967] (D, H, M, S).
- 866 *Mangelia subdiaphana* CARPENTER, 1864. Rare (8), under rocks (S).
- 867 *Mangelia antiochroa* PILSBRY & LOWE, 1932. Rare, beach specimen (H).
- \* *Philbertia scammoni* DALL, 1919. Rare (8), under rocks; Scammon's Lagoon, west coast of Lower California (S).
- 893\* *Tenaturris carissima* (PILSBRY & LOWE, 1932). Rare, beach specimen; Manzanillo, Mexico (M).
- 894 *Tenaturris nereis* (PILSBRY & LOWE, 1932). Rare (8), under rocks (D, H, M, S).
- 908 *Hormospira maculosa* (SOWERBY, 1834). Uncommon (2), on silty mud reef (D, S).
- 913 *Pleuroliria picta* (REEVE, 1843, ex BECK MS.). Dredged in 11 m (6), (D).
- 922 *Conus princeps* LINNAEUS, 1758. Beach specimen (K).
- 930 *Conus ximenes* GRAY, 1839. Common (3, 14), partially buried in sand flats (D, H, K, M, S).
- 931 *Conus mahogani* REEVE, 1843. Uncommon (9), on sand flats (D, S).
- 941 *Conus regularis* SOWERBY, 1833. Rare (3), on silty mud flats (K).
- 955\* *Terebra albocincta* (CARPENTER, 1857). Uncommon (9), sand bar next to Willard Island (coll. DuShane December 1964, Puertecitos) (D, H, K, S).
- 956 *Terebra armillata* HINDS, 1844. Uncommon (9), on sand bars (D, S).
- 980 *Terebra variegata* GRAY, 1834. Common (3, 14), on silty mud flats and sand bars (D, K, S).
- \* *Terebra berryi* CAMPBELL, 1961 (p. 26). Uncommon (9), on sand bar; Puertecitos, Gulf of California [see DUSHANE, 1962] (D, S).
- Terebra dushanae* CAMPBELL, 1964 (p. 135). Rare, beach specimen (H).
- 982 *Bulla gouldiana* PILSBRY, 1895. Uncommon (12), in tide pools (D, H, M).
- 983 *Bulla punctulata* A. ADAMS, in SOWERBY, 1850. Uncommon, beach specimens (H).
- 984 *Haminocia angelensis* BAKER & HANNA, 1927. Beach specimen (H).
- 986 *Haminocia strongi* BAKER & HANNA, 1927. Common (12), in small tide pools around rocks (D, H, S).
- 992 *Acteocina angustior* BAKER & HANNA, 1927. Rare (8), under rocks (S).
- 993\* *Acteocina carinata* (CARPENTER, 1857). Uncommon (8), under rocks; Guaymas, Mexico (DUSHANE & POORMAN, 1967) (S).
- 995 *Acteocina infrequens* (C. B. ADAMS, 1852). Uncommon (8), under rocks (S).
- Retusa gonzagensis* BAKER & HANNA, 1927 (p. 131). Uncommon (8), under rocks [type locality] (S).
- 1007 *Pyramidella panamensis* DALL & BARTSCH, 1909. Rare, beach specimen (D).
- Aplysia* sp. Rare (8), among rocks (L).
- Berthellina* sp. Uncommon (8), under rocks (L).
- Tridachiella diomedeae* (BERGH, 1894) (p. 125). Uncommon (8), under rocks (L).
- Rostanga pulchra* MACFARLAND, 1905 (p. 35). Uncommon (8), under rocks (L).
- Acanthodoris* spec. nov. Uncommon (8), under rocks (L).
- Hermisenda crassicornis* (ESCHSCHOLTZ, 1831) (p. 15). Common (8), under rocks (L).
- Spurilla chromosoma* COCKERELL & ELIOT, 1905 (p. 31). Common (8), under rocks (L).
- \* *Melampus mousleyi* BERRY, 1964 (p. 152). Common (1), in mud under *Salicornia* bushes; Cholla Cove, Bahía de Adair, Sonora, Mexico (D, S).
- 1023\* *Melampus tabogensis* C. B. ADAMS, 1852. Rare (1), in mud under *Salicornia* bushes; Guaymas, Mexico (DUSHANE & POORMAN, 1967) (D).
- 1025 *Pedipes liratus* BINNEY, 1860. Rare, beach specimens (D, H).

## AMPHINEURA

- 5 *Chiton virgulatus* SOWERBY, 1840. Common (8, 10), under rocks (H, M, S).
- 8 *Acanthochitona* cf. *A. arragonites* (CARPENTER, 1857). Rare (8), under rocks (H).
- 9 *Acanthochitona exquisita* (PILSBRY, 1893). Common (7, 8), under rocks (S).
- 23 *Ischnochiton tridentatus* PILSBRY, 1893. Rare (8), under rocks (H).
- 27 *Callistochiton gabbi* PILSBRY, 1893. Uncommon (8), under rocks (H).
- 28 *Callistochiton infortunatus* PILSBRY, 1893. Rare (7, 8), under rocks (H, S).
- 39 *Lepidozona clathrata* (REEVE, 1847). Rare (7, 8), under rocks (H, S).